Regression Testing

A. Hamam

Why does software change.

- Besides adding features
- Corrective
- Perfective
- Adaptive
- Preventive

Overview

- Regression testing is the process of re-testing software that has been modified
- It constitutes the vast majority of testing effort in commercial software development
- Essential part of testing
- Large components or systems tend to have a large regression test sets.
- Small changes in software could lead to a problem in a distant part !

Automation

- Regression testing must be automated
- JUnit tests ! – most common automated tests in Java
- Capture/Replay tools for GUI
- Tests can be version controlled
- Scripts manages the process of obtaining test inputs, executing the software, marhsinling the outputs, comparing the actual and expected outputs and generating test reports.

Which tests to include in regression testing

- Goldilocks problem
- Including every test is bad (too large a set and cannot keep up with the changes) and very few test is bad (not enough functionality is tested)
- Regression testing usually need to execute daily (usually overnight).
  - Evaluate software changes during the day and evaluate results during the morning.
- If regression tests do not finish in a timely manner, the development process is disrupted.
- Spend money to do all the tests could be worthwhile, but at some point the marginal cost of adding a new test is not worth the expense.
- Test doubles might speed up execution

Which tests to include in regression testing

- Customers are more willing to tolerate new problems rather than keep encountering old issues
  - Regression testing is important.

What if a regression test fails

- Determine if the software is faulty or if the test itself is broken.

Optimizing Regression Tests

- Add or remove tests from regression set with caution
- Limit time needed to execute regression tests

9.1 Principles of System Testing

Regression Testing

- Identifies new faults that may have been introduced as current ones are being corrected
- Verifies a new version or release still performs the same functions in the same manner as an older version or release

9.1 Principles of System Testing

Regression Testing Steps

- Inserting the new code
- Testing functions known to be affected by the new code
- Testing essential function of *m* to verify that they still work properly (the actual regression tests)
- Continuing function testing *m* + 1